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U.S. National Bureau of Standards

Tables for converting customary and metric...

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[1891]

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UNITED STATES COAST AND GEODETIC SURVEY.

OFFICE OF STANDARD WEIGHTS AND MEASURES.

T. C. MENDENHALL, Superintendent.

TABLES

FOR CONVERTING

CUSTOMARY AND METRIC

WEIGHTS AND MEASURES.

2—779

UNITED STATES
COAST AND GEODETIC SURVEY.
OFFICE OF
STANDARD WEIGHTS AND MEASURES.
T. C. MENDENHALL, SUPT.

TABLES FOR CONVERTING U. S. WEIGHTS AND MEASURES.

CUSTOMARY TO METRIC.

LINEAR.

	Inches to millimetres.	Feet to metres.	Yards to metres.	Miles to kilometres.
1 =	25·4001	0·304801	0·914402	1·60935
2 =	50·8001	0·609601	1·828804	3·21869
3 =	76·2002	0·914402	2·743205	4·82804
4 =	101·6002	1·219202	3·657607	6·43739
5 =	127·0003	1·524003	4·572009	8·04674
6 =	152·4003	1·828804	5·486411	9·65608
7 =	177·8004	2·133604	6·400813	11·26543
8 =	203·2004	2·438405	7·315215	12·87478
9 =	228·6005	2·743205	8·229616	14·48412

CAPACITY.

	Fluid drams to millilitres or cubic centimetres.	Fluid ounces to millilitres.	Quarts to litres.	Gallons to litres.
1 =	3·70	29·57	0·94636	3·78543
2 =	7·39	59·15	1·89272	7·57087
3 =	11·09	88·72	2·83908	11·35630
4 =	14·79	118·29	3·78543	15·14174
5 =	18·48	147·87	4·73179	18·92717
6 =	22·18	177·44	5·67815	22·71261
7 =	25·88	207·02	6·62451	26·49804
8 =	29·57	236·59	7·57087	30·28348
9 =	33·27	266·16	8·51723	34·06891

SQUARE.

	Square inches to square centimetres.	Square feet to square decimetres.	Square yards to square metres.	Acres to hectares.
1 =	6·452	9·290	0·836	0·4047
2 =	12·903	18·581	1·672	0·8094
3 =	19·355	27·871	2·508	1·2141
4 =	25·807	37·161	3·344	1·6187
5 =	32·258	46·452	4·181	2·0234
6 =	38·710	55·742	5·017	2·4281
7 =	45·161	65·032	5·853	2·8328
8 =	51·613	74·323	6·689	3·2375
9 =	58·065	83·613	7·525	3·6422

WEIGHT.

	Grains to milligrammes.	Avoirdupois ounces to grammes.	Avoirdupois pounds to kilogrammes.	Troy ounces to grammes.
1 =	64·7989	28·3495	0·45359	31·10348
2 =	129·5978	56·6991	0·90719	62·20696
3 =	194·3968	85·0486	1·36078	93·31044
4 =	259·1957	113·3981	1·81437	124·41392
5 =	323·9946	141·7476	2·26796	155·51740
6 =	388·7935	170·0972	2·72156	186·62088
7 =	453·5924	198·4467	3·17515	217·72437
8 =	518·3914	226·7962	3·62874	248·82785
9 =	583·1903	255·1457	4·08233	279·93133

CUBIC.

	Cubic inches to cubic centimetres.	Cubic feet to cubic metres.	Cubic yards to cubic metres.	Bushels to hectolitres.
1 =	16·387	0·02832	0·765	0·35239
2 =	32·774	0·05663	1·529	0·70479
3 =	49·161	0·08495	2·294	1·05718
4 =	65·549	0·11327	3·058	1·40957
5 =	81·936	0·14158	3·823	1·76196
6 =	98·323	0·16990	4·587	2·11436
7 =	114·710	0·19822	5·352	2·46675
8 =	131·097	0·22654	6·116	2·81914
9 =	147·484	0·25485	6·881	3·17154

1 Gunter's chain	=	20·1168	metres.
1 sq. statute mile	=	259·000	hectares.
1 fathom	=	1·829	metres.
1 nautical mile	=	1853·25	metres.
1 foot = 0.304801 metre,		9·4840158	log.
1 avoir. pound	=	453·5924277	gram.
15432·35639 grains	=	1	kilogramme.

The only authorized material standard of customary length is the Troughton scale belonging to this office, whose length at 59°.62 Fahr. conforms to the British standard. The yard in use in the United States is therefore equal to the British yard.

The only authorized material standard of customary weight is the Troy pound of the Mint. It is of brass of unknown density, and therefore not suitable for a standard of mass. It was derived from the British standard Troy pound of 1758 by direct comparison. The British Avoirdupois pound was also derived from the latter, and contains 7,000 grains Troy.

The grain Troy is therefore the same as the grain Avoirdupois, and the pound Avoirdupois in use in the United States is equal to the British pound Avoirdupois.

The British gallon = 4.54346 litres.

The British bushel = 36.3477 litres.

The length of the nautical mile given above and adopted by the U. S. Coast and Geodetic Survey many years ago, is defined as that of a minute of arc of a great circle of a sphere whose surface equals that of the earth (Clarke's Spheroid of 1866).

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WASHINGTON, D. C., NOVEMBER, 1891.

UNITED STATES
COAST AND GEODETIC SURVEY.
OFFICE OF
STANDARD WEIGHTS AND MEASURES.
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TABLES FOR CONVERTING U. S. WEIGHTS AND MEASURES.

METRIC TO CUSTOMARY.

LINEAR.

	Metres to inches.	Metres to feet.	Metres to yards.	Kilometres to miles.
1 =	39·3700	3·28083	1·093611	0·62137
2 =	78·7400	6·56167	2·187222	1·24274
3 =	118·1100	9·84250	3·280833	1·86411
4 =	157·4800	13·12333	4·374444	2·48548
5 =	196·8500	16·40417	5·468056	3·10685
6 =	236·2200	19·68500	6·561667	3·72822
7 =	275·5900	22·96583	7·655278	4·34959
8 =	314·9600	26·24667	8·748889	4·97096
9 =	354·3300	29·52750	9·842500	5·59233

CAPACITY.

	Millilitres or cubic centimetres to fluid drams.	Centilitres to fluid ounces.	Litres to quarts.	Decalitres to gallons.	Hectolitres to bushels.
1 =	0·27	0·338	1·0567	2·6417	2·8377
2 =	0·54	0·676	2·1134	5·2834	5·6755
3 =	0·81	1·014	3·1700	7·9251	8·5132
4 =	1·08	1·353	4·2267	10·5668	11·3510
5 =	1·35	1·691	5·2834	13·2085	14·1887
6 =	1·62	2·029	6·3401	15·8502	17·0265
7 =	1·89	2·367	7·3968	18·4919	19·8642
8 =	2·16	2·705	8·4535	21·1336	22·7019
9 =	2·43	3·043	9·5101	23·7753	25·5397

SQUARE.

	Square centimetres to square inches.	Square metres to square feet.	Square metres to square yards.	Hectares to acres.
1 =	0·1550	10·764	1·196	2·471
2 =	0·3100	21·528	2·392	4·942
3 =	0·4650	32·292	3·588	7·413
4 =	0·6200	43·055	4·784	9·884
5 =	0·7750	53·819	5·980	12·355
6 =	0·9300	64·583	7·176	14·826
7 =	1·0850	75·347	8·372	17·297
8 =	1·2400	86·111	9·568	19·768
9 =	1·3950	96·875	10·764	22·239

WEIGHT.

	Milligrammes to grains.	Kilogrammes to grains.	Hectogrammes to ounces avoirdupois.	Kilogrammes to pounds avoirdupois.
1 =	0·01543	15432·36	3·5274	2·20462
2 =	0·03086	30864·71	7·0548	4·40924
3 =	0·04630	46297·07	10·5822	6·61387
4 =	0·06173	61729·43	14·1096	8·81849
5 =	0·07716	77161·78	17·6370	11·02311
6 =	0·09259	92594·14	21·1644	13·22773
7 =	0·10803	108026·49	24·6918	15·43236
8 =	0·12346	123458·85	28·2192	17·63698
9 =	0·13889	138891·21	31·7466	19·84160

CUBIC.

	Cubic centimetres to cubic inches.	Cubic decimetres to cubic inches.	Cubic metres to cubic feet.	Cubic metres to cubic yards.
1 =	0·0610	61·023	35·314	1·308
2 =	0·1220	122·047	70·629	2·616
3 =	0·1831	183·070	105·943	3·924
4 =	0·2441	244·094	141·258	5·232
5 =	0·3051	305·117	176·572	6·540
6 =	0·3661	366·140	211·887	7·848
7 =	0·4272	427·164	247·201	9·156
8 =	0·4882	488·187	282·516	10·464
9 =	0·5492	549·210	317·830	11·771

WEIGHT—(CONTINUED).

	Quintals to pounds av.	Milliers or tonnes to pounds av.	Kilogrammes to ounces Troy.
1 =	220·46	2204·6	32·1507
2 =	440·92	4409·2	64·3015
3 =	661·39	6613·9	96·4522
4 =	881·85	8818·5	128·6030
5 =	1102·31	11023·1	160.7537
6 =	1322·77	13227·7	192·9044
7 =	1543·24	15432·4	225·0552
8 =	1763·70	17637·0	257·2059
9 =	1984·16	19841·6	289·3567

By the concurrent action of the principal governments of the world an International Bureau of Weights and Measures has been established near Paris. Under the direction of the International Committee, two ingots were cast of pure platinum-iridium in the proportion of 9 parts of the former to 1 of the latter metal. From one of these a certain number of kilogrammes were prepared, from the other a definite number of metre bars. These standards of weight and length were intercompared, without preference, and certain ones were selected as International prototype standards. The others were distributed by lot, in September, 1889, to the different governments and are called National prototype standards. Those apportioned to the United States were received in 1890 and are in the keeping of this office.

The metric system was legalized in the United States in 1866.

The International Standard Metre is derived from the Mètre des Archives, and its length is defined by the distance between two lines at 0° Centigrade, on a platinum-iridium bar deposited at the International Bureau of Weights and Measures.

The International Standard Kilogramme is a mass of platinum-iridium deposited at the same place, and its weight in vacuo is the same as that of the Kilogramme des Archives.

The litre is equal to a cubic decimetre, and it is measured by the quantity of distilled water which, at its maximum density, will counterpoise the standard kilogramme in a vacuum, the volume of such a quantity of water being, as nearly as has been ascertained, equal to a cubic decimetre.

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